

CLAIMS

We Claim:

- 5 1. A batch process for producing a pressurized liquid carbon dioxide stream comprising:
 - distilling a feed stream comprising carbon dioxide vapor off of a liquid carbon dioxide supply;
 - introducing the carbon dioxide vapor feed stream into at least one purifying filter;
 - condensing the purified feed stream within a condenser to form an intermediate liquid carbon dioxide stream;
 - introducing the intermediate liquid carbon dioxide stream into at least one high-pressure accumulation chamber;
 - 15 heating said high pressure accumulation chamber to pressurize the liquid carbon dioxide contained therein to a delivery pressure;
 - delivering a pressurized liquid carbon dioxide stream from the high-pressure accumulation chamber; and,
 - discontinuing delivery of the pressurized liquid carbon dioxide stream for
- 20 replenishing the high pressure accumulation chamber.
- 25 2. The process of claim 1, further comprising venting the high-pressure accumulation chamber to the condenser to facilitate introduction of the intermediate liquid stream into the accumulation chamber.
3. The process of claim 1, further comprising passing the pressurized liquid carbon dioxide stream through a particle filter prior to delivery to a cleaning process.
4. The process of claim 1, wherein said feed stream is condensed within said condenser through indirect heat exchange with a refrigerant stream.
- 30 5. The process of claim 1, further comprising accumulating the intermediate liquid carbon dioxide stream in a receiver prior to introduction into the high-pressure accumulation chamber.

6. The process of claim 5, wherein the condenser is integral with the receiver.
7. The process of claim 1, further comprising detecting when the high-pressure accumulation chamber requires replenishment of liquid carbon dioxide.
8. The process of claim 1, wherein the high-pressure accumulation chamber is electrically heated.

10 9. The process of claim 1, wherein the carbon dioxide vapor feed stream is introduced into a coalescing filter.

10. The process of claim 1, wherein the carbon dioxide vapor feed stream is introduced into a particle filter.

15 11. An apparatus for producing a purified, pressurized liquid carbon dioxide stream comprising:

- a bulk liquid carbon dioxide supply tank for distilling off a feed stream comprising carbon dioxide vapor;
- 20 a purifying filter for purifying the carbon dioxide vapor feed stream;
- a condenser for condensing the carbon dioxide vapor feed stream into an intermediate liquid carbon dioxide stream;
- a receiver for accumulating the intermediate liquid carbon dioxide stream;
- 25 a high-pressure accumulation chamber for accepting the intermediate liquid carbon dioxide stream from the receiver;
- a heater for heating the high-pressure accumulation chamber for pressurizing the carbon dioxide liquid contained therein to a delivery pressure;
- a sensor for detecting when the high-pressure accumulation chamber requires replenishment of liquid carbon dioxide;

30 a flow network having conduits connecting the bulk supply tank, the condenser, the receiver and the high-pressure accumulation chamber and for discharging the pressurized liquid carbon dioxide stream therefrom;

the conduits of said flow network including a vent line from the high-pressure accumulation chamber to the condenser to facilitate introduction of the intermediate liquid carbon dioxide stream into the accumulation chamber; and,

5 the flow network having valves associated with said conduits to allow for isolation of components of the apparatus.

12. The apparatus of claim 11, further comprising a particle filter connected to the flow network to filter the pressurized liquid carbon dioxide stream.

10 13. The apparatus of claim 11, wherein the condenser includes an external refrigeration circuit having a heat exchanger to condense the vapor feed stream through indirect heat exchange with a refrigerant stream.

15 14. The apparatus of claim 11, wherein the condenser is integral with the receiver.

15. The apparatus of claim 11, wherein the heater comprises an electrical heater.

20 16. The apparatus of claim 11, wherein the purifying filter for the carbon dioxide vapor feed stream is a coalescing filter.

17. The apparatus of claim 11, wherein the purifying filter for the carbon dioxide vapor feed stream is a particle filter.

25 18. The apparatus of claim 11, wherein the sensor is a level sensor.

19. The apparatus of claim 11 wherein the sensor is a pressure sensor.